



# UNITED STATES PATENT AND TRADEMARK OFFICE

A

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/925,059	08/08/2001	Evan Y.W. Zhang	ZYB 0001 PA	2617
7590	01/19/2006		EXAMINER	
Evan Y. W. Zhang Zybron Inc. 3915 Germany Lane Beavercreek, OK 45431			LEE, SHUN K	
			ART UNIT	PAPER NUMBER
			2884	

DATE MAILED: 01/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/925,059	<b>Applicant(s)</b> ZHANG, EVAN Y.W.	
	<b>Examiner</b> Shun Lee	<b>Art Unit</b> 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 August 2005 and 16 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 44-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 44-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 August 2001 and 25 August 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submissions filed on 25 August 2005 and 16 November 2005 have been entered.

### ***Drawings***

2. The drawings were received on 25 August 2005. These drawings are not acceptable. The drawings are objected to because "FIG. 5A" in Fig. 5A should probably be --FIG. 5-- (see pg. 8, line 25). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as

either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Objections***

4. Claims 47-50 are objected to because of the following informalities:

- (a) in claim 47, "common optical aperture" on line 2 should probably be --common aperture--;
- (b) in claim 48, "and/or near infrared" on line 3 should probably be deleted (*i.e.*, the specification on lines 12-14 of pg. 16 discloses that a beam combiner 129 is used to fuse or integrate the VIS/NIR radiation rendered visible by the NIR sensor 116, and the LWIR radiation rendered visible by the LWIR sensor 118);
- (c) in claim 48, "an infrared output" on line 5 should probably be --an electronic output-- (*i.e.*, the specification on lines 6-7 of pg. 16 discloses that the display 121 behind the UFPA 119 converts the electronic LWIR image to a visible image);
- (d) in claim 49, "micron" on line 7 should probably be --micrometer--;
- (e) in claim 49, "micron" on line 8 should probably be --micrometer--;

(f) in claim 50, "said first and second sensors" on line 13 should probably be --said processor--; and

(g) in claim 50, "a third optical output" on line 15 should probably be --said third optical output--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 44-51 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification (pg. 2, line 29 to pg. 3, line 3) discloses that "Both sensors are combined in a single camera sharing a common aperture, and as such, parallax is eliminated between the sensors. Further, a display device is provided along an optical axis in common with the camera, thus eliminating parallax between the display and camera". While the specification teach that both sensors share a common aperture, the specification does not appear to teach that both sensors are along a common optical axis. Claim 44 recites the limitation "said first sensor and said second sensor are aligned along said common optical axis such that parallax between said first and second sensor is substantially eliminated". Applicant

Art Unit: 2884

has not pointed out where the new claims are supported, nor does there appear to be a written description of the claim limitation "said first sensor and said second sensor are aligned along said common optical axis such that parallax between said first and second sensor is substantially eliminated" in the application as filed.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The instant application was filed on 8 August 2001 and claims benefit under 35 U.S.C. 119(e) to provisional application 60/224,189 filed 9 August 2000. The effective filing date is the filing date of the provisional application for any claims which are fully supported under the first paragraph of 35 U.S.C. 112 by the provisional application (MPEP § 706.02). Applicant has not pointed out where new claims 44-51 are fully supported in the provisional application, nor does there appear to be a written description of the claim limitations "a beam combining device arranged to optically fuse said first optical output from said first sensor and said second optical output from said second sensor into a third optical output" in the provisional application.

8. Claims 44, 45, 47, and 48 are rejected under 35 U.S.C. 102(e) as being anticipated by Korniski *et al.* (US 6,646,799).

The specification (pg. 1) describes the visible (VIS) band as  $\sim 0.4 \mu\text{m}$  to  $\sim 0.76 \mu\text{m}$ , the near infrared (NIR) band as  $\sim 0.76 \mu\text{m}$  to  $\sim 1.1 \mu\text{m}$ , the short wave infrared (SWIR) band as  $\sim 1.1 \mu\text{m}$  to  $\sim 3 \mu\text{m}$ , the medium wave infrared (MWIR) band as  $\sim 3 \mu\text{m}$  to  $\sim 7 \mu\text{m}$ , and the long wave infrared (LWIR) band as  $\sim 7 \mu\text{m}$  to  $\sim 18 \mu\text{m}$ .

In regard to claim **44**, Korniski *et al.* disclose (Fig. 3a) an image fusing system comprising:

(a) a camera having:

(a1) a common aperture arranged to allow target radiation to enter said camera along a common optical axis;

(a2) a beam splitter (320) arranged to receive said target radiation passed through said common aperture (310) and to split said target radiation into a first spectral band (*e.g.*, VIS/NIR; column 5, lines 4-14) and a second spectral band (*e.g.*, LWIR; column 4, line 58 to column 5, line 3) which is different from said first spectral band;

(a3) a first sensor (340) arranged to receive said radiation in said first spectral band and to provide a first optical output representing a first optical image of said radiation filtered into said first spectral band (*e.g.*, VIS/NIR; column 5, lines 4-14); and

(a4) a second sensor (330, 360) arranged to receive said radiation in said second spectral band and to provide a second optical output representing a second optical image of said radiation filtered into said second spectral band (*e.g.*, MWIR or LWIR; column 4, line 58 to column 5, line 3);

(b) a beam combining device (350) arranged to optically fuse said first optical output from said first sensor (340) and said second optical output from said second sensor (330, 360) into a third optical output; and

(c) a viewer (355) for viewing said third optical output;

wherein: said first sensor (340) and said second sensor (330, 360) are aligned along said common optical axis such that parallax between said first (340) and second (330, 360) sensor is inherently substantially eliminated due to said common optical axis and said camera and said viewer (355) are aligned along said common optical axis such that parallax between said camera and said viewer (355) is inherently substantially eliminated due to said common optical axis.

In regard to claim **45** which is dependent on claim 44, Korniski *et al.* also disclose (Fig. 3a) a common lens (310) as said common aperture that is transmissive to at least said first and second spectral bands; a first relay lens (335) in a first optical path between said beam splitter (320) and said first sensor (340), wherein said common lens (310) combines with said first relay lens (335) to correct aberrations in said first spectral band (column 5, lines 4-14); and a second relay lens (325) in a second optical path between said beam splitter (320) and said second sensor (330, 360), wherein said common lens (310) combines with said second relay lens (325) to correct aberrations in said second spectral band (column 4, line 58 to column 5, line 3).

In regard to claim **47** which is dependent on claim 44, Korniski *et al.* also disclose (Fig. 3a) that said beam splitter (320) comprises a common beam splitter (320) as said common optical aperture to split said target radiation into a first optical path and a



Art Unit: 2884

second optical path; a first objective lens (335) in said first optical path between said beam splitter (320) and said first sensor (340) to filter radiation into said first spectral band and to send said first spectral band of radiation to said first sensor (340); and a second objective lens (325) in said second optical path between said beam splitter (320) and said second sensor (330, 360) to filter radiation into said second spectral band and to send said second spectral band of radiation to said second sensor (330, 360).

In regard to claim **48** which is dependent on claim 44, Korniski *et al.* also disclose (Fig. 3a) that said first sensor (340) comprises at least one of a charge coupled device or an image intensifier for generating said first optical output in visible and/or near infrared (column 5, lines 4-14); said second sensor (330, 360) comprises an infrared focal plane ray (330) and a display (360) to convert an infrared output of said FPA to a visible image (column 4, line 58 to column 5, line 3); and said beam combining device (350) is arranged to optically fuse said first optical output and said second optical output for viewing.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 46 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korniski *et al.* (US 6,646,799).

In regard to claim **46** which is dependent on claim 45, Korniski *et al.* also disclose (column 11, lines 56-67) that second relay lens comprises infrared material. The system of Korniski *et al.* lacks an explicit description that said first relay lens comprises glass. However, Korniski *et al.* further disclose (column 11, lines 56-67) that one skilled in the art readily understands that the optical parameters such as material of all of the lenses used in the embodiments of the present invention are selectable based on the specific design requirements of each imaging system. Therefore it would be obvious to one of ordinary skill at the time of the invention to select a material (e.g., glass) for the first relay lens in the system of Korniski *et al.* based on the specific design requirements of a desired imaging system.

In regard to claim **49** which is dependent on claim 48, the system of Korniski *et al.* lacks an explicit description that said beam combining device comprises a narrow band filter to pass substantially all green light from said first sensor at a peak wavelength of near 0.55 micron with a bandwidth of near  $\pm 0.01$  micron, and to reflect substantially all other visible light from said display of said second sensor and to fuse said VIS/NIR and LIR images. However, Korniski *et al.* further disclose (column 5, lines 15-25) that different colors must be used for the two images combined in the eyepiece, in order to distinguish the overlaid image. Therefore it would be obvious to one of ordinary skill at the time of the invention to provide a beam combining device in the system of Korniski *et al.* have a desired transmission spectral band (e.g.,  $\sim 0.55 \pm 0.01 \mu\text{m}$ ) and reflection spectral band (e.g., substantially all other visible light), in order to distinguish the overlaid image.

Art Unit: 2884

11. Claims 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korniski *et al.* (US 6,646,799) in view of Horn (US 6,335,526).

In regard to claims **50** and **51** which are dependent on claim 44, the system of Korniski *et al.* lacks a transmitter capable of wirelessly transmitting to a remote receiver a first electronic output representing a first electronic image of said radiation filtered into said first spectral band, a second electronic output representing a second electronic image of said radiation filtered into said second spectral band, and a third electronic output from a processor electronically fusing or combining said first electronic output and said second electronic output; and a display device arranged such that said first electronic output and said second electronic output may be selectively displayed. Horn teaches (column 3, line 1 to column 4, line 23) to obtain electronic images and fused images for automated target recognition wherein these electronic images and fused images can also be selectively displayed a display device with other relevant information and to provide a transmitter capable of wirelessly transmitting to a remote receiver electronic output representing the images, in order to communicate images and other relevant information to a command and control center. Therefore it would be obvious to one of ordinary skill at the time of the invention to obtain electronic images and fused images in the system of Korniski *et al.* for automated target recognition which can be displayed and/or transmitted together with other relevant information to a command and control center.

***Response to Arguments***

12. Applicant's arguments with respect to the new claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Tuesday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SL

  
CONSTANTINE HANNAHER  
PRIMARY EXAMINER